DOCUMENT RESUME

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ABSTRACT

Many problems and activities which can be worked with a calculator are contained in this booklet. The problems include: pattern recognition, combinations of operations, estimation, squares and square roots, rate problems, area, and volume. Chapter topics include: getting to know the calculator, single-step problems, using formulas, and multiple-step problems. (MP)

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GETTING TO KNOW THE CALCULATOR

A. Make your calculator count by 1's for 10 seconds. At this rate, what number would be displayed on your calculator at the end of 60 seconds?

B. Use your calculator to find this sum:

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10

Use your method to find these sums:

1 + 2 + 3 + . . . + 100 (sum of the first 100 numbers)

1 + 2 + 3 + . . . + 1,000 (sum of the first 1,000 numbers)

Can you find the sum of the first 1,000,000 counting numbers?

HINT: Look at your other sums.

C. Use the keys 1, 2, 3, 4, 5, 6, 7, 8, 9 and the plus and minus keys to display 100.

Can you do it with only three plus and minus pushes?

SE 025 249

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D. Make a guess to find the keys to punch for these. Test your guess on your calculator.

6 [ ] 8 [=] 14

6 [ ] 8 [=] 48

1 [ ] 8 [=] .125

6 [ ] 8 [=] -2

12 [ ] 15 [=] 180

125 [ ] 25 [=] 5

E. Use your calculator to solve the multiplication problems.

You can use only these numbers:

2, 3, 5, 7, 11, 13, 17, 19

_____ X _____ = 10

_____ X _____ X _____ = 42

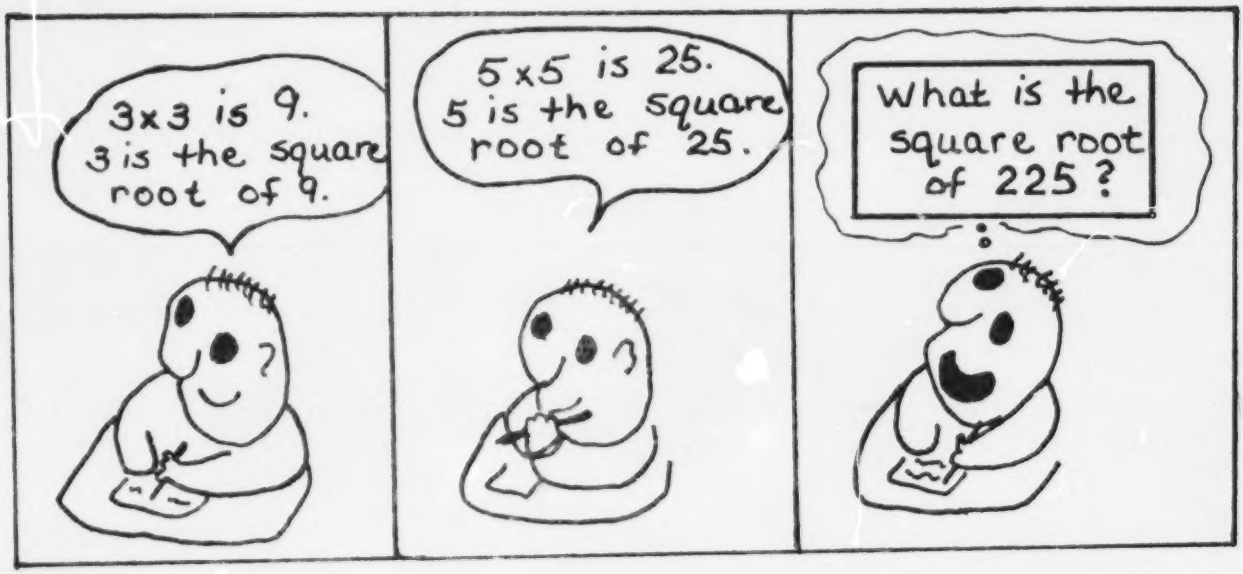
_____ X _____ X _____ = 105

_____ X _____ X _____ = 110

_____ X _____ X _____ = 1001

_____ X _____ X _____ = 935

F.



G. 1. What is the largest 4-digit number that can be multiplied by 9 to give a product which is a 4-digit number?

2. What is the largest 4-digit number that can be multiplied by 8 to give a product which is a 4-digit number?

H. Find the smallest number that is evenly divisible by every whole number from 1 to 10.

I.

PERFECT SQUARES

1
4
9
16

4 is a perfect square because 2 x 2 = 4.
25 is a perfect square because 5 x 5 = 25.
81 is a perfect square because 9 x 9 = 81.
What number can you add to both 100 and 164 to get two perfect squares?

J.

Mary thought of a number. She multiplied the number by 4, then added 6. This result she divided by 2. Finally she subtracted 4. If her result was 59, what number was Mary thinking of?

MAKE A GUESS

K. Which of these comoutations would "overflow" on an 8-digit calculator?

A. 829 x645

B. 14750 x 9843

C. 9.861 x6.254

D. 12345678 x 2

E. 43210 x 62500

F. 46389 x 1007

G. 56.250 x94.86

H. 43100 x 6035

Check your guesses on a calculator.

L. Compute with your calculator. Turn your calculator upside down to check.

PROBLEM	CLUE
7 + (24 x 25)	Log
125 + 214 - 1	Bee
30 x 258 - 2	Bell
5 x 499 x 31	Shell
27405 ÷ 9	Shoe
96 x 73 ÷ 2	Hose

Make up your own problems and clues.

M. Enter only 4's and any sequence of operation keys. See if you can make the machine display all the whole numbers from 1 to 10.

N. Enter nine four times and any combination of operations to display 20 in your machine.

O. Use the 2 key 5 times and the plus key to display 28.

Use the 8 key 8 times and the plus key to display 1,000.

How many ways can you add four odd numbers to get a sum of 10?

How many ways can you add eight odd numbers to get 20?

If you add 2 + 2, you get the same as when you multiply 2 x 2. For three numbers 1 + 2 + 3 = 1 x 2 x 3. Can you find four numbers where changing + to x doesn't change the result? (five numbers?)

SINGLE-STEP PROBLEMS

A.

Fish Bait
$1.29

Reel
$12.75

Pole
$15.50

Line
$3.45

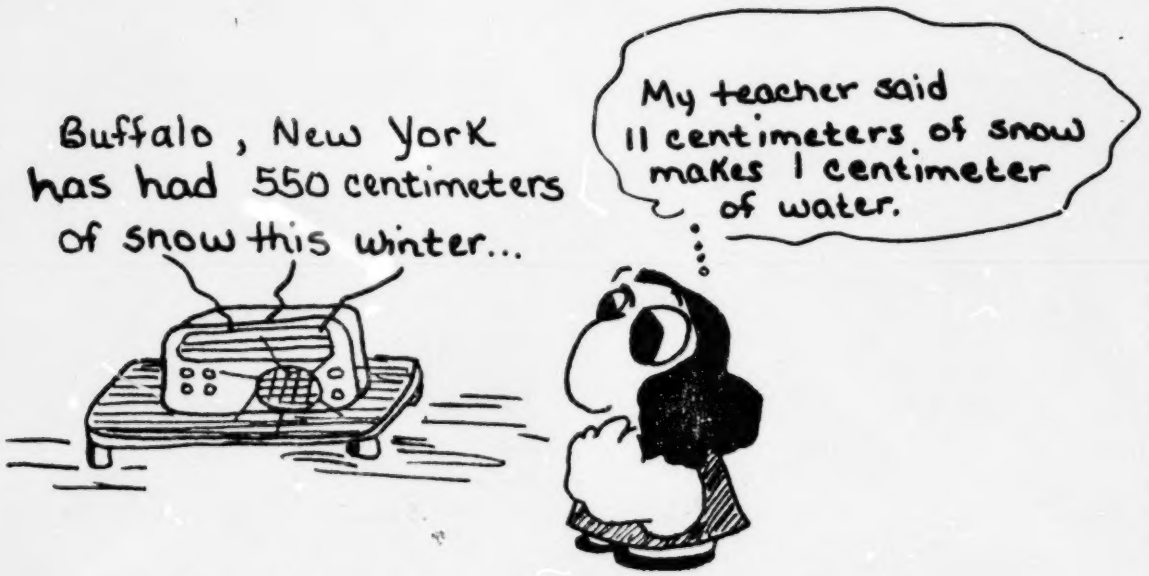
Boots
$15.85

Net
$4.75

$14.04	$20.25	$9.49	$31.70
_____	_____	_____	_____
_____	_____	_____	_____
		_____	_____

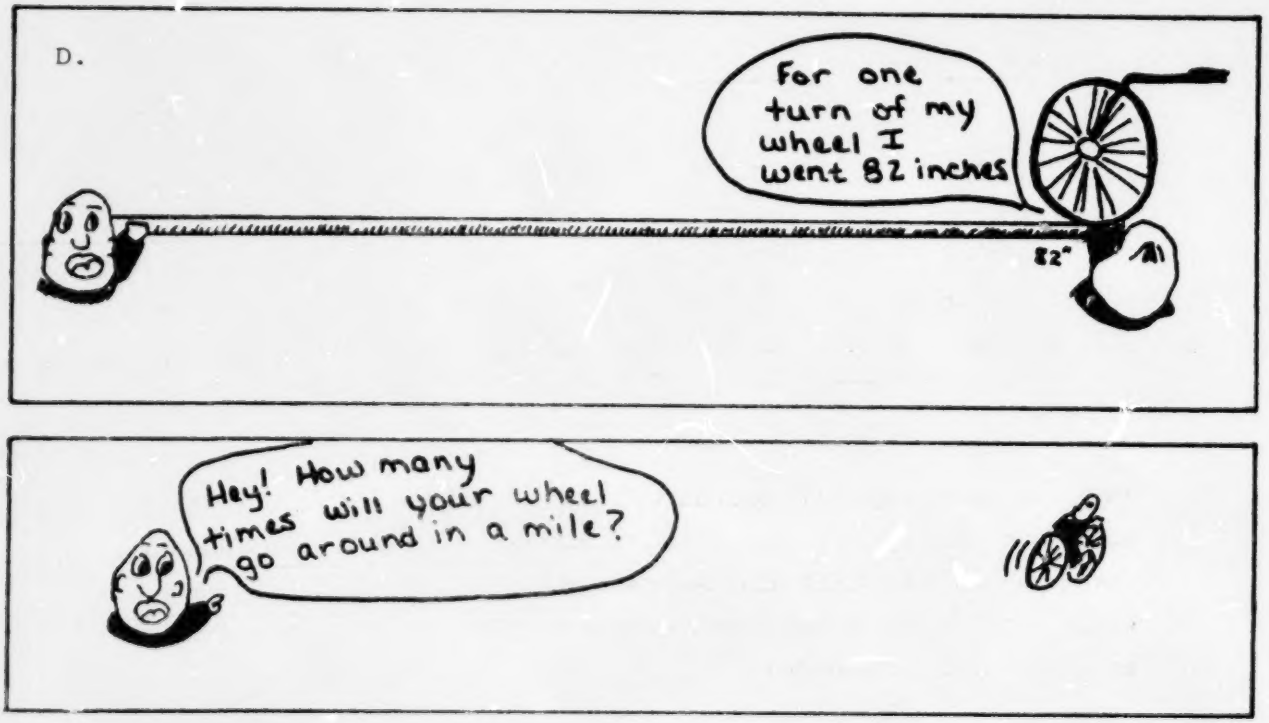
B. Mark has a stamp collection of United States stamps. He told the class that the total face value of all his stamps was $256.25 and that the average face value of his stamps was $0.082. He asked the class to tell him how many stamps he had. Can you answer?

C.


Buffalo, New York has had 550 centimeters of snow this winter...
My teacher said 11 centimeters of snow makes 1 centimeter of water.

How many centimeters of water would be produced from 550 centimeters of snow?

D.



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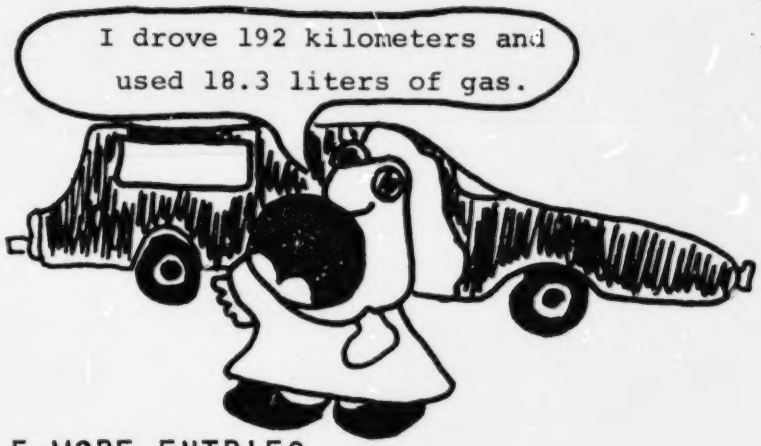


MAKE A TABLE WITH 5 MORE ENTRIES.

Kilometers	192	
Liters	18.3	

F. In one year, one acre of land can produce this many pounds of these foods:

Kind of Food	Number of Pounds
Wheat	3,717
Corn	4,540
Rice	5,368

(1) Would 18 acres of rice produce as much food as 25 acres of wheat?

(2) How many acres of corn would produce as much food as 80 acres of rice?

G. It was raining when I walked home from school tonight. I had part of my math assignment done, but it got wet. Help me fill in the numbers that got wet.

67	5	64	473
4	13	20	2
+ 8	+ 7	+ 18	+ 156
149	327	759	2225

H.

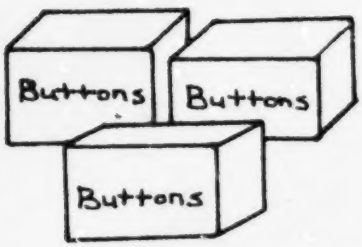
COMPLETE THE TABLE.

Cans	1	2	5	15		
Cost	29¢	58¢			$3.48	$13.05

I. At 15 miles an hour, a car travels 22 feet in one second.

1. How many feet does a car going 15 miles an hour travel in 5 seconds?
2. How long does it take a car going 15 miles an hour to travel 300 feet?
3. How long does it take a car going 30 miles an hour to travel 44 feet?
4. If a car travels 88 feet in one second, how fast is the car traveling in miles per hour?

J.



The Neato Shirt Company buys tons of buttons. For the Exec Model, they use 11 buttons on each shirt.

COMPLETE THE TABLE TO SHOW THE BUTTONS NEEDED.

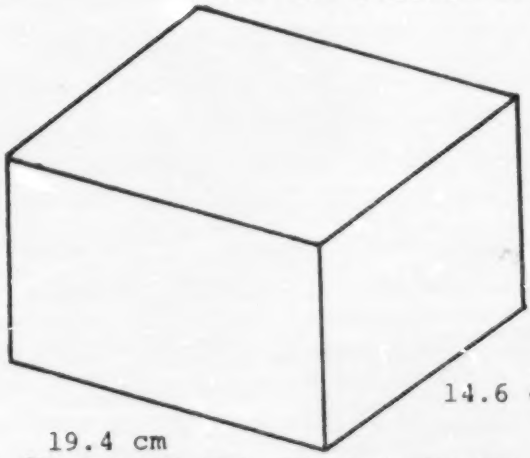
Shirts	10,000	15,250	12,243	9,999
Buttons				

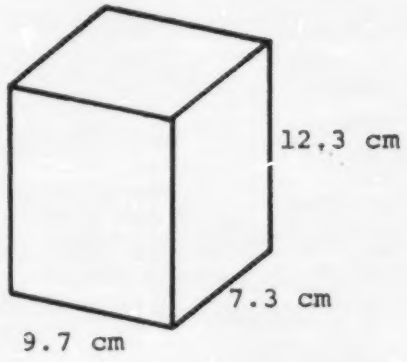
USING FORMULAS

A. The volume of a solid in which all the sides are rectangles is found by the formula:

$$\text{Volume} = \ell \times w \times h$$

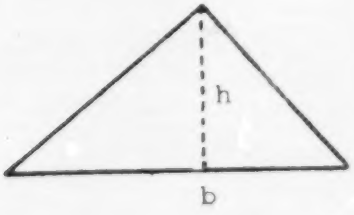
Use the formula to find the volume of these.



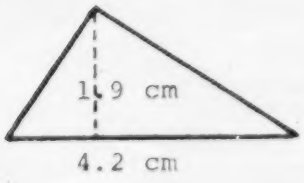


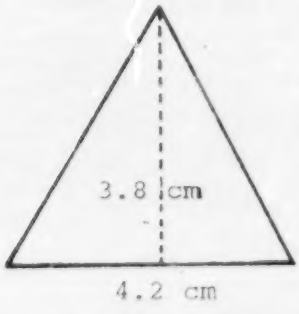
B. The area of a triangle is found by the formula:

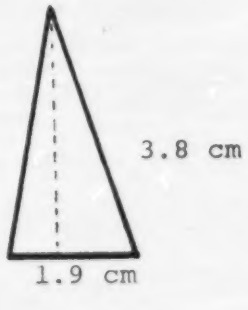
$$A = .5 \times b \times h$$



Find the area of these triangles.







C. The distance around a circle (the circumference) is found by the formula:

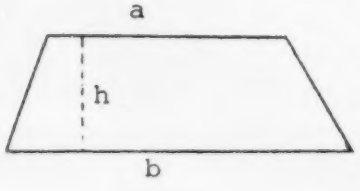
$$C = 3.14 \times D$$

D is the distance across the circle (the diameter).

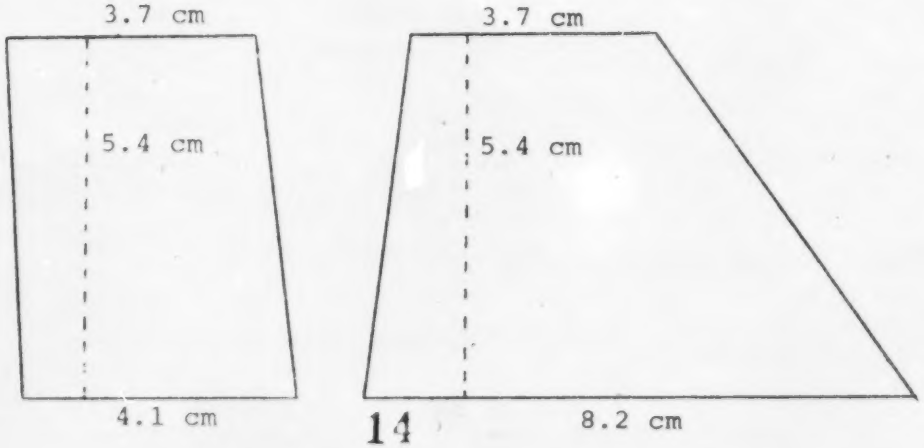
Use the formula to find these circumferences.

D. The area of a trapezoid is found by the formula:

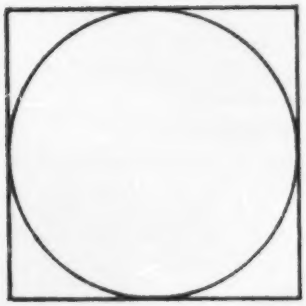
$$A = .5\ h\ (a + b)$$



Find the area of these.



E.



What percent of the square region is covered by the circle?

These formulas will help:

Area of the Square = S^2

Area of the Circle = 3.14 x r x r

F.

An object dropped from a plane falls according to the formula:

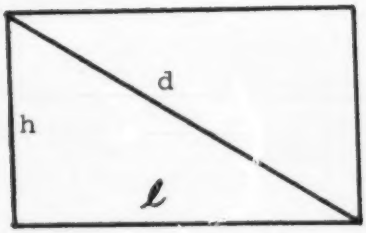
$$d = 5 \times t \times t$$

d is the distance (in meters) the object falls and t is the time (in seconds).

1. How far will an object fall in 10 seconds?

2. If the formula is correct, how long will it take an object to fall 4,000 meters?

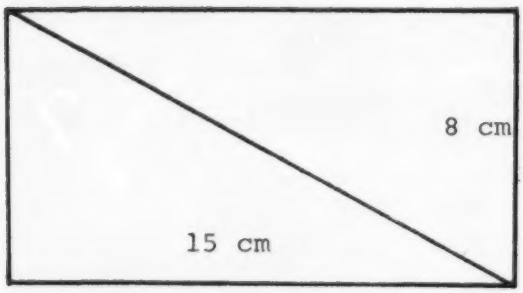
G.

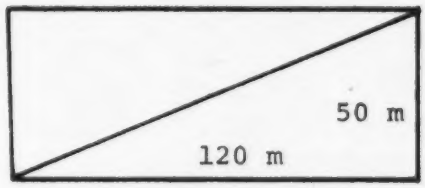


When all the dimensions are given in the same units, the formula for the length of a diagonal of a rectangle is:

$d \times d = \ell \times \ell + h \times h$

Find the diagonal of these rectangles:





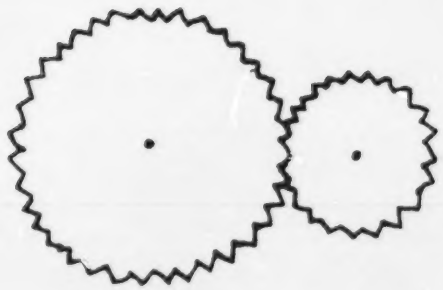
H. The volume of a sphere is found by the formula:

$$V = 4.1888\ r^3$$

Find the volume of these spheres:

1. radius is 36 mm (an orange).
2. radius is 43 cm (a beach ball).
3. diameter is 12 m (storage tank).

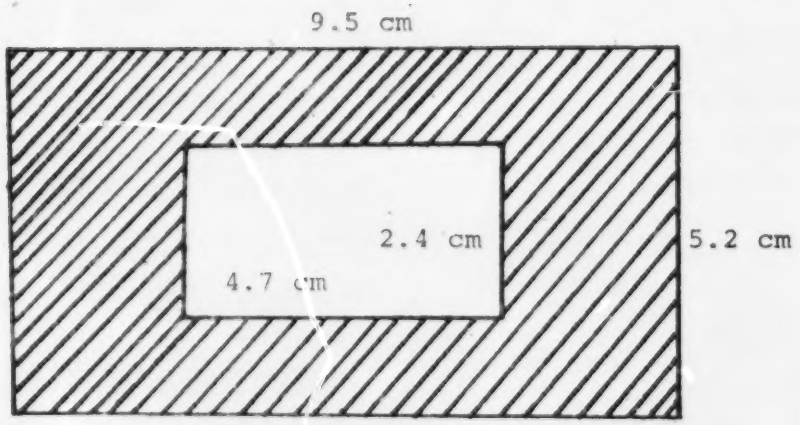
J. When the big wheel turns 1 revolution, the little wheel turns 1.83 revolutions.



MAKE A TABLE WITH 5 MORE ENTRIES.

Revolutions on big wheel	1			
Revolutions on little wheel	1.83			

K.



Use your calculator to find the area of the shaded region.

MULTIPLE STEP PROBLEMS

A.

If a water faucet drips 18 drips in 10 seconds, how much water will be lost in 24 hours? Which of these guesses would you choose?

1 gallon 10 gallons

100 gallons 1000 gallons

B. A dollar bill weighs about 1 gram and $10 bills, $20 bills, and $50 bills weigh the same. Of course you would rather have 100 grams of $10 bills than 100 grams of one dollar bills, but which of these amounts would you rather have:

1. 20 grams of $10 bills, 40 grams of one dollar bills, and 40 grams of $20 bills.
2. 10 grams of $50 bills, 70 grams of one dollar bills, and 20 grams of $10 bills.
3. 100 grams made up of half one dollar bills, one-fourth $10 bills, one-fifth $20 bills and the rest $50 bills.

C. During the basketball season, I scored 83 field goals. I scored 210 points. How many free throws did I make?

D.

You are counting railroad cars. 14 railroad cars go by in 1 minute. Railroad cars are about 70 feet long. Estimate the speed of the moving train in miles per hour.

E. Al's company charges $12.50 per hour plus $15.75 for a service call. Find the bill for these customers:

Maude Phrumpet	1 hour
Roscoe Wills	3 hours
Ramsey Grant	1 hour 30 minutes
Grace Beasley	4 hours 30 minutes

F.

If you stacked 14 billion hamburgers, how high would the stack be?

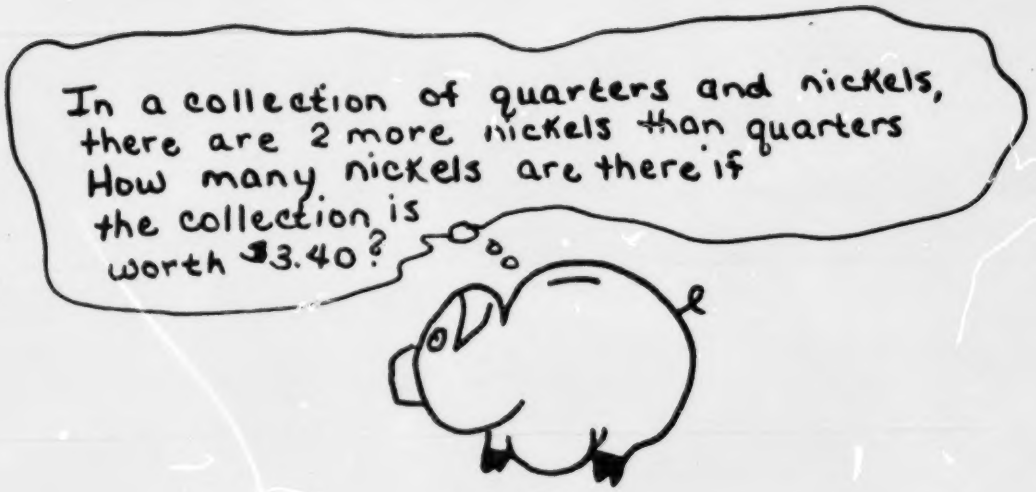
G. A softball team bought 12 balls at $1.65 each and 5 bats at $2.15 each. The cost is to be shared equally among the eleven team members. How much is each person's share?

H.

There were 101 people that came across on the Mayflower in 1620. If you were a direct descendant of two of those people, how many relatives (include only father, mother, grandfather, grandmother, etc.) would you have since 1620? (Assume a new generation every 20 years.)

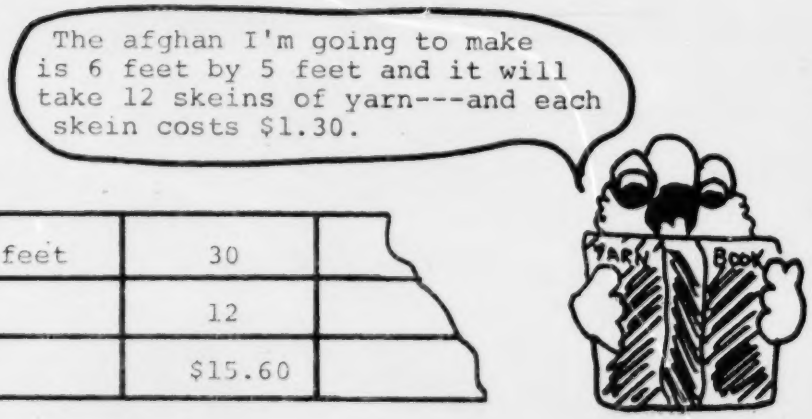
Year	1976	1956	1936		
Generation	1	2	3		
Number of relatives	2	4	8		

I.


In a collection of quarters and nickels, there are 2 more nickels than quarters How many nickels are there if the collection is worth $3.40?

J. The planet Mercury takes 88 days to travel around the sun. Earth takes about 365 days to circle the sun. In five years, how many times will each planet travel around the sun?

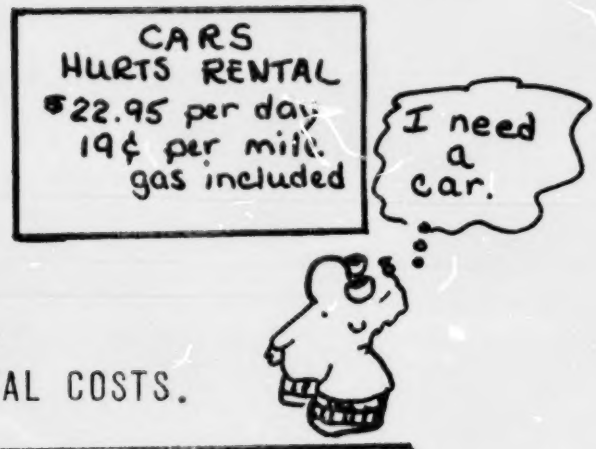
K.



Square feet	30	
Skeins	12	
Cost	$15.60	

1. How much yarn should I buy to make a 5 feet by 10 feet afghan?
2. How many skeins are needed to make a 7 feet by 8 feet afghan?
3. How much does it cost to make a 6 feet by 7 feet afghan?

L.

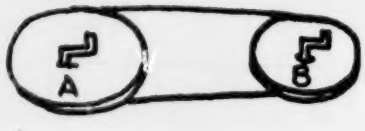


CALCULATE THE RENTAL COSTS.

Days	1	2	3	3	4	
Miles	100	225	375	480	525	
Total bill	$41.95					

M. MAKE A TABLE WITH 5 MORE ENTRIES.

Turns of A	2		
Turns of B	5		



1. When pulley A turns 20 times, how many times does pulley B turn?
2. When pulley B turns 30 times, how many times does pulley A turn?
3. A motor turns pulley B 160 times in a minute. When this motor is connected, how many times does pulley A turn in one minute?
4. How fast must I turn pulley A to get pulley B to turn 100 times a minute?

ACTIVITY PROBLEMS

A.

How many pieces of paper does it take to make a pile 1 centimeter thick?
Use your estimate to answer these:

1. If a stack of paper is 5 centimeters thick, how many sheets are in the stack?
2. How many sheets would there be in a stack 1 meter high (100 centimeters)?
3. How high a stack would a million sheets of paper make?

B.

About how long is a lima bean? Use your estimate to answer these questions.

1. How many lima beans would make a line across your desk if your desk is 60 cm across?
2. How many lima beans would it take end to end to go across your classroom if the classroom is about 10 meters wide?
3. How long a line could you make with 10,000 beans end to end?

c. COUNT YOUR HEARTBEATS FOR 1 MINUTE.
MAKE A TABLE TO SOLVE THESE PROBLEMS.

Number of minutes	
Number of heartbeats	

1. How many heartbeats do you expect to have in the next 10 minutes?
2. How many heartbeats in the next 60 minutes?
3. How many heartbeats in one day?

D.

1. Estimate how long a chain you and 3 friends can make.
2. How long a chain could be made with 28 students?
3. Estimate how many students are needed to make a chain 100 feet long.

E. GET SOME PAPER CLIPS. ASK SOMEONE TO TIME YOU BUILD A CHAIN OF 10 CLIPS. COLLECT YOUR DATA AND COMPLETE THE TABLE

Clips	10	20	25	30
Seconds				

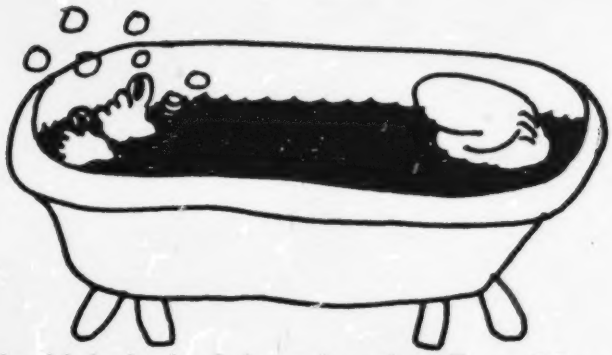
USE YOUR TABLE.

1. How long would it take you to build a chain of 40 clips?
2. What would be the time to chain a whole box of 500 clips?
3. You linked paper clips together for 3 minutes. About how long is your chain?

F. Use a reading book.
Count the number of words in a line. Make a record of the number of words in several lines. Use your information to find the average number of words in a line.

G. Use a reading book.
Count the number of lines on a page. Do it many times.
Find the average number of lines on a page.

H.



A full size bathtub holds about 45 gallons of water.

1. Estimate how much water you use when you take a bath.
2. Estimate how many baths you take in a year.
3. Estimate how many gallons of bathtub water you use in a year.

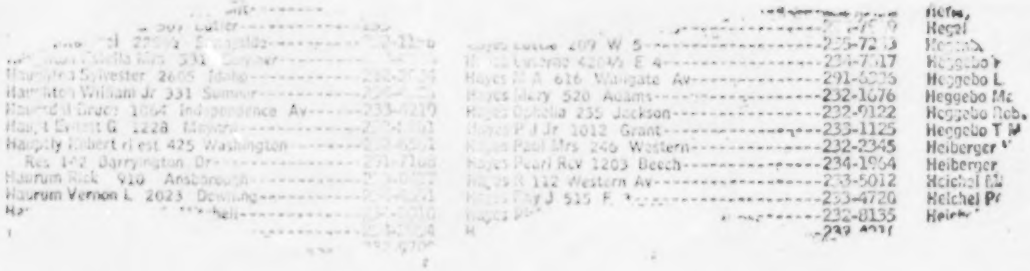
I. Use a reading book.
Use the average number of words per lineeand lines per page to estimate the number of words to a page. How many pages are in the book? Estimate how many words are in the book.

J.

COMPLETE THE TABLE.

Distance across (cm)	1	5.2	4.37	.94	97.6
Distance around (cm)	3.14	16.33			

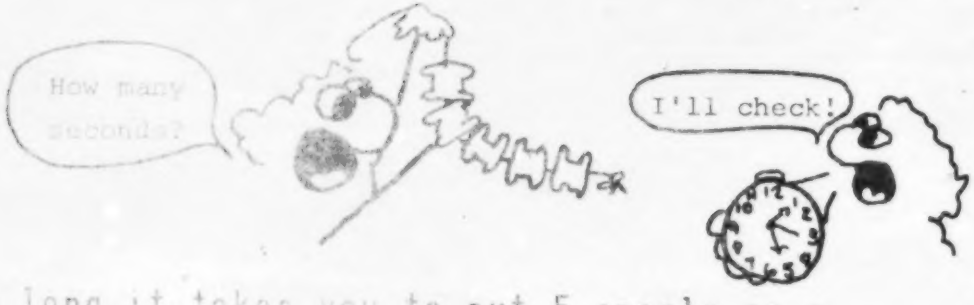
K.



FIND A TELEPHONE BOOK

1. How many phone numbers are on a page?
2. How many phone numbers are in your book?
3. If there are 1,000,000 phone numbers in a Chicago phone book, how many pages would it take to list them?

L.



Find how long it takes you to put 5 spools on a piece of string. Use the time it took to make a 5 spool snake to estimate how long you would take to make the longer snakes. Do not build the longer snakes.

Number of spools	5	10	15	30	100
Time					